

In re Application of:
RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 2

PATENT
Docket No.: K35A1302

Claim Listing:

1. (original) A disk drive for servicing host commands, comprising:
cache memory having a plurality of memory clusters for caching disk data of disk sectors identified by logical block addresses; and
a cache control system including
 a tag memory having a plurality of tag records, each tag record for defining a variable length segment of the memory clusters for caching disk data for a range of logical block addresses and each tag record for indicating the range of logical block addresses,
 a scan engine only usable for scanning the tag records having
 means for receiving a range of logical block addresses associated with a host command,
 means for reading the ranges of logical block addresses defined by the tag records,
 means for comparing the range of logical block addresses associated with the host command with the ranges of logical block addresses indicated in the tag records,
 means for providing scan results, based on a comparison by the means for comparing, indicating overlap between the logical block address range associated with the host command and the ranges of logical block addresses indicated in the tag records.

In re Application of:

RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 3

PATENT
Docket No.: K35A1302

2. (original) A disk drive as defined in claim 1, wherein the means for comparing further determines whether a first logical block address of a range of logical block addresses associated with a host command is within the ranges of logical block addresses indicated in the tag memory records, and the means for providing scan results indicates the tag records determined by the means for comparing to have a range including the first logical block address.

3. (original) A disk drive as defined in claim 1, wherein the means for providing scan results indicates whether an entire logical block address range, a portion of the logical block address range, or none of the logical block address range associated with a host command is within the ranges of logical block addresses in the tag memory records.

4. (original) A disk drive as defined in claim 1, wherein the means for providing scan results indicates whether the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag records such that a start logical block address for the host command is greater than a start logical block address for the overlapping tag record range.

5. (original) A disk drive as defined in claim 1, wherein the means for providing scan results indicates whether only a portion of the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag memory records.

6. (original) A disk drive as defined in claim 5, wherein the means for providing scan results indicates whether the portion of the logical block address range associated with a host command that is within a range of the ranges of logical block addresses in the tag records includes the beginning or the end of the logical address range associated with the host command.

In re Application of:
RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 4

PATENT
Docket No.: K35A1302

7. (canceled).

8. (canceled).

9. (original) A cache control system for servicing host commands using a cache memory having a plurality of memory clusters for caching disk data of disk sectors identified by logical block addresses, comprising:

a tag memory having a plurality of tag records, each tag record for defining a variable length segment of the memory clusters for caching disk data for a range of logical block addresses, and each tag record for indicating the range of logical block addresses; and

a scan engine only usable for scanning the tag records having

means for receiving a range of logical block addresses associated with a host command,

means for reading the ranges of logical block addresses defined by the tag records,

means for comparing the range of logical block addresses associated with the host command with the ranges of logical block addresses indicated in the tag records,

means for providing scan results, based on a comparison by the means for comparing, indicating overlap between the logical block address range associated with the host command and the ranges of logical block addresses indicated in the tag records.

In re Application of:
RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 5

PATENT
Docket No.: K35A1302

10. (original) A cache control system as defined in claim 9, wherein the means for comparing further determines whether a first logical block address of a range of logical block addresses associated with a host command is within the ranges of logical block addresses indicated in the tag memory records, and the means for providing scan results indicates the tag records determined by the means for comparing to have a range including the first logical block address.

11. (original) A cache control system as defined in claim 9, wherein the means for providing scan results indicates whether an entire logical block address range, a portion of the logical block address range, or none of the logical block address range associated with a host command is within the ranges of logical block addresses in the tag memory records.

12. (original) A cache control system as defined in claim 9, wherein the means for providing scan results indicates whether the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag records such that a start logical block address for the host command is greater than a start logical block address for the overlapping tag record range.

13. (original) A cache control system as defined in claim 9, wherein the means for providing scan results indicates whether only a portion of the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag memory records.

In re Application of:
RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 6

PATENT
Docket No.: K35A1302

14. (original) A cache control system as defined in claim 9, wherein the means for providing scan results indicates whether the portion of the logical block address range associated with a host command that is within a range of the ranges of logical block addresses in the tag records includes the beginning or the end of the logical address range associated with the host command.

15. (canceled).

16. (canceled).

17. (original) A method for servicing host commands using a cache memory having a plurality of memory clusters for caching disk data of disk sectors identified by logical block addresses, comprising:

providing a tag memory having a plurality of tag records, each tag record for defining a variable length segment of the memory clusters for caching disk data for a range of logical block addresses and each tag record for indicating the range of logical block addresses;

receiving a range of logical block addresses associated with a host command;

reading the ranges of logical block addresses defined by the tag records;

comparing the range of logical block addresses associated with the host command with the ranges of logical block addresses indicated in the tag records; and

providing scan results based on the comparing step, indicating overlap between the logical block address range associated with the host command and the ranges of logical block addresses indicated in the tag records.

In re Application of:

RALPH H. CASTRO et al.

Application No.: 10/627,512

Filed: July 25, 2003

Page 7

PATENT
Docket No.: K35A1302

18. (original) A cache method as defined in claim 17, wherein the comparing step further includes determining whether a first logical block address of a range of logical block addresses associated with a host command is within the ranges of logical block addresses indicated in the tag memory records, and step of providing scan results includes indicating the tag records determined by the means for comparing to have a range including the first logical block address.

19. (original) A cache method as defined in claim 17, wherein the step of providing scan results includes indicating whether an entire logical block address range, a portion of the logical block address range, or none of the logical block address range associated with a host command is within the ranges of logical block addresses in the tag memory records.

20. (original) A cache method as defined in claim 17, wherein the step of providing scan results includes indicating whether the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag records such that a start logical block address for the host command is greater than a start logical block address for the overlapping tag record range.

21. (original) A cache method as defined in claim 17, wherein the step of providing scan results includes indicating whether only a portion of the logical block address range associated with a host command is within a range of the ranges of logical block addresses in the tag memory records.

In re Application of:
RALPH H. CASTRO et al.
Application No.: 10/627,512
Filed: July 25, 2003
Page 8

PATENT
Docket No.: K35A1302

22. (original) A cache method as defined in claim 17, wherein the step of providing scan results includes indicating whether the portion of the logical block address range associated with a host command that is within a range of the ranges of logical block addresses in the tag records includes the beginning or the end of the logical address range associated with the host command.